# Quad y-positional Tolerance

Y-DIMENSION

1) Pole-piece profile to indexed corner of QM: ± .0015
2) Y-shim thickness: ± .0005
3) Raft mounting surface flatness: ± .0005
4) CMM calibration precision: ± .0005
5) Magnetic to mechanical center deviation: ± .0005

$$\delta y = \sqrt{(.0015)^2 + (.0005)^2 + (.0005)^2 + (.0005)^2 (.0005)^2} = .0018 = 3\sigma$$

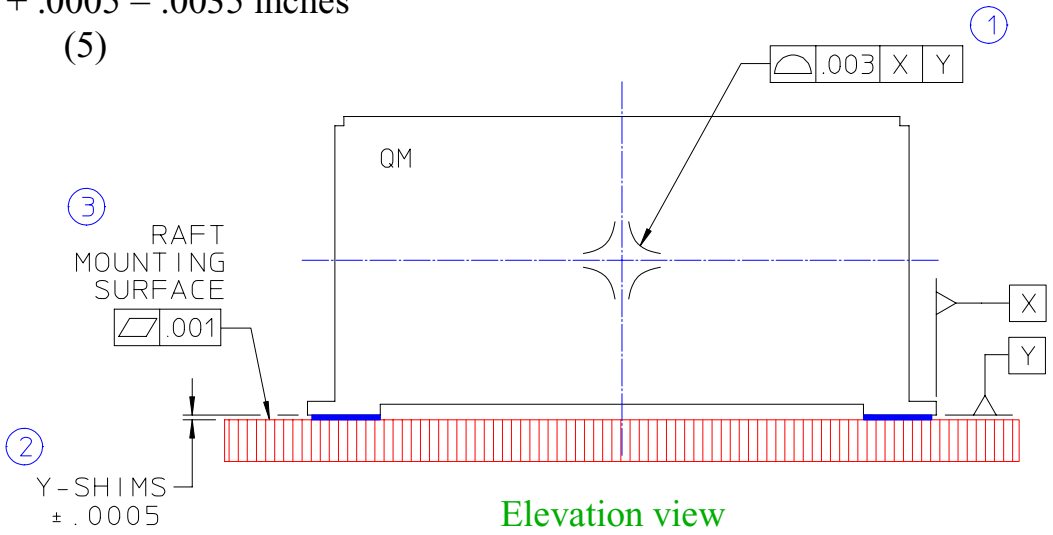
(1) (2) (3) (4) (5)

**σ = .0006 inches RMS , requirement is σ = .001 RMS**

Worst Case misalignment:

Δy = .0015 + .0005 + .0005 + .0005 + .0005 = .0035 inches

(1) (2) (3) (4) (5)




Elevation view

# Quad x-positional tolerance

X-DIMENSION

1) Pole-piece profile to indexed corner of QM: ± .0015
2) X-shim thickness: ± .0005
3) X- shim rail flatness: ± .0005
4) CMM calibration precision: ± .0005
5) Magnetic to mechanical center deviation: ± .0005

$$\delta y = \sqrt{(.0015)^2 + (.0005)^2 + (.0005)^2 + (.0005)^2\ (.0005)^2} = .0018 = 3\sigma$$

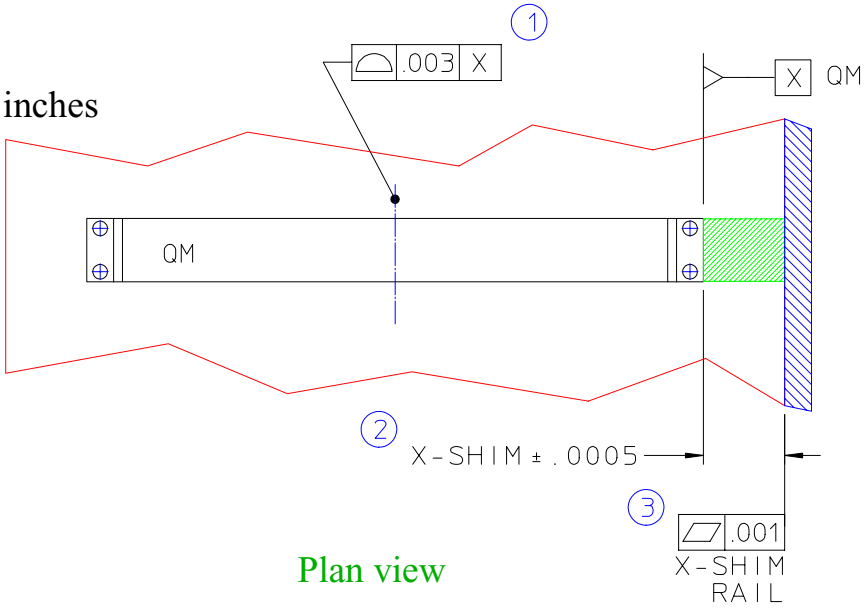
(1) (2) (3) (4) (5)

**$\sigma$ = .0006 inches RMS , requirement is $\sigma$ = .001 RMS**

Worst Case misalignment:

$\Delta x = .0015 + .0005 + .0005 + .0005 + .0005 = .0035$ inches

(1) (2) (3) (4) (5)




Plan view

# Quad z-positional tolerance

Z-DIMENSION

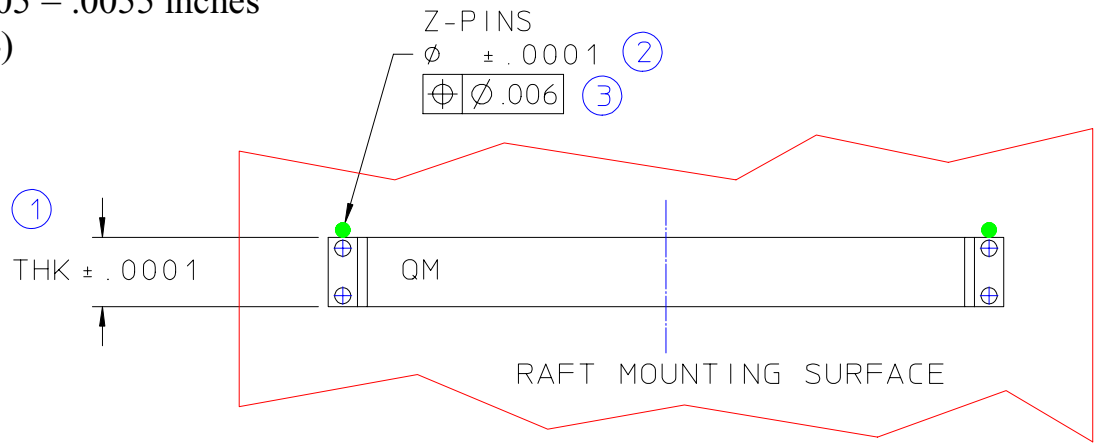
1) QM thickness (post-assy grinding): ± .0001
2) Dowel pin diameter: ± .0001
3) Dowel pin hole positional tolerance: ± .003
4) CMM calibration precision: ± .0005

$$\delta y = \sqrt{(.0001)^2 + (.0001)^2 + (.003)^2 + (.0005)^2} = .003 = 3\sigma$$
(1) (2) (3) (4)

**σ= .001inches RMS , requirement is σ = .005 RMS**

Worst Case misalignment:

Δy = .0001 + .0001 + .0003 + .0005 = .0055 inches
(1) (2) (3) (4)




Plan view